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Notes on behavior of Smith's Longspurs wintering in Oklahoma

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The Smith's Longspur (*Calcarius pictus*) breeds in a narrow range along the northern edge of the boreal forest and has a restricted wintering range (Fig. 1; Briskie 1993). Little is known about the population status or the basic wintering biology of Smith's Longspurs (Grzybowski 1982, 1983a, b), in large part because their behavior makes them difficult to observe (Kemsies 1968). This paper reports results from a brief field study of the species' wintering behavior and assesses possibilities for further study.

METHODS

Longspurs were studied at Sooner Lake, Noble and Pawnee Counties, Oklahoma (36°23'N 97°05'W), from 4–8 February 1998. The lake is surrounded by approximately 750 ha of fenced land owned by OG&E Electric Services, mostly native mixed-grass prairie (Kuchler 1964). Some of the property is accessible to the public as a recreation area, and much of the remaining land is leased for hay production or grazing.

The entire property was searched for longspurs, but the main study site was a 50-ha field at its northern boundary. We located birds by walking through fields dragging a 30-m rope between us, then counted all birds that flushed. Daily observations were made from mid-morning until dark, mainly without a blind. Weather was fair during the study, with daytime temperatures about 5-15° C., and there was no snow on the ground.

We attempted to catch birds using both mist nets and ground traps baited with mixed seed. Nets were set where birds were found most often, but flocks did not reliably return to an area following disturbance. We therefore tried carrying mist nets between us, holding the poles parallel to the ground and walking slowly towards flocks in order to get the net over them before they flushed.

Tape recordings of longspur calls were obtained from the Cornell Laboratory of Ornithology's Library of Natural Sounds and from the Borror Laboratory of Bioacoustics at Ohio State University. These were broadcast from a tape player to test their use as an attractant. We also used

data from Smith's Longspur specimens in the Oklahoma Museum of Natural History in Norman and from Christmas Bird Counts.

RESULTS

We counted about 400 birds on the Sooner Lake property, concentrated in five separate areas. Even if we missed many individuals, we doubt that more than 1000 longspurs wintered there, and more likely about 500. The main study plot (50 ha) had a flock of about 125 birds.

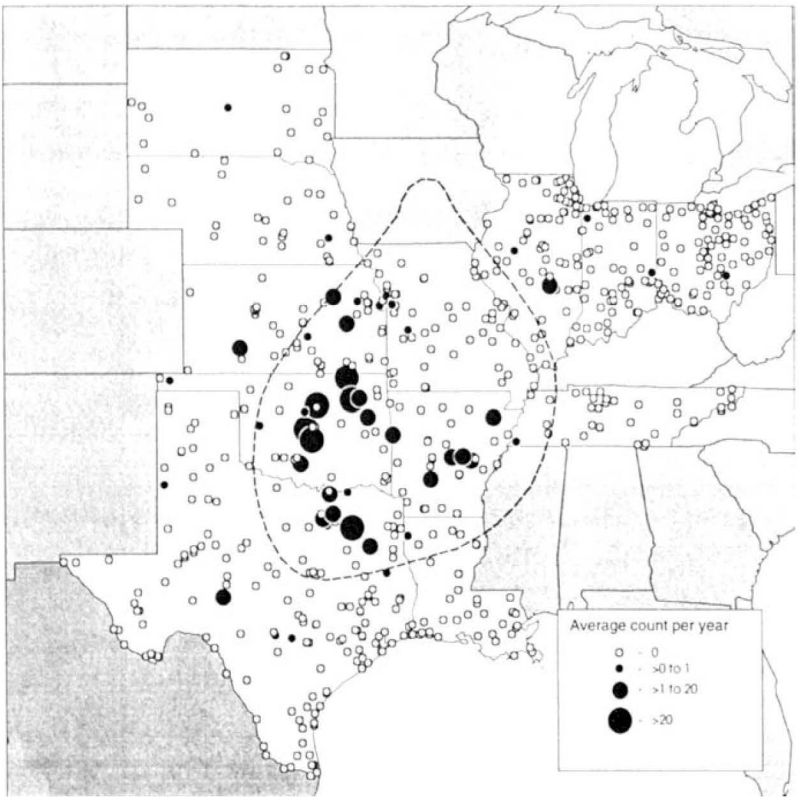

Fig. 1. Winter range of Smith's Longspurs (dotted line) according to Briskie (1993). All states where Smith's Longspurs were recorded on Christmas Bird Counts (CBC), 1959–88, are shown in white, with circles representing CBC sites (single reports in New York and Maryland were omitted). Solid circles indicate sites where longspurs were recorded at least once, and size of the circle indicates mean annual count.

Longspurs were most abundant in fields with dense short grass, mostly silver beardgrass (*Andropogon saccharoides*) generously interspersed with *Aristida* (three-awn grass) and little bluestem (*Schizachyrium scoparium*). While presence of *Aristida* was an excellent sign that longspurs might be present, the birds appeared to prefer parts of the fields where this grass was mixed with bluestem and other taller species rather than in pure patches. Fields with woody growth such as broom snakeroot (*Gutierrezia sarothrae*) were generally unoccupied. Some birds were found in fields being actively grazed by cattle, but fields comprised mainly of short grass seemed to be less attractive than those with tall grass mixed in. While the main study field had not been grazed in 20 years, hay was apparently cut on a regular basis. Longspur flocks often frequented the lower portions of sloped fields, near damp areas or small streams.

Longspurs did not associate with other bird species. The only other birds present in the same fields were LeConte's Sparrows (*Ammodramus lecontii*), with one or two in each field that contained longspur flocks, and meadowlarks (nearly all Eastern Meadowlarks, *Sturnella magna*). Northern Harriers (*Circus cyaneus*) regularly patrolled the study field. They are predators of adult longspurs (Briskie 1993), and their approach usually caused longspurs to flush. Coyotes (*Canus latrans*) may also be longspur predators, and at least five were heard howling in the area. Red-tailed Hawks (*Buteo jamaicensis*) and American Kestrels (*Falco sparverius*) were common but ignored by longspurs.

Longspurs spent the majority of their time on the ground, often in small openings in the grass where they could stand directly on the soil. Shallow holes (about 1–2 cm deep and 5–10 cm across) made by nine-banded armadillos (*Dasypus novencinctus*) often contained one or two bird droppings. Foraging birds appeared to spend at least a few minutes in a single spot before running to another spot within a meter of the original. This limited movement, combined with the depth of the grass, made birds exceedingly difficult to see when on the ground, even though we could carefully approach flocks to within several meters without causing disturbance.

When flushed, longspurs often took off in groups of 10–30 birds, rising vertically 3–5 m from the field before gathering into a flock. Frequently additional birds took off after further disturbance, although large groups (>30) seemed more likely to flush all at once. After taking flight, separate groups usually merged into a single flock and flew about 15–30 m above the ground. Flocks would typically mill back and forth, flying away from the disturbance, then returning, and sometimes landing again in the vicinity of their take-off point. An individual in the flock might suddenly change direction, with several others following close behind; birds in the lead might then turn and follow the new direction, but if they did not, the birds that had initially changed direction might reverse again. Occasionally large flocks (>75) would split into smaller groups during these flights.

As a prelude to landing, some individuals would start to make steep downward swoops, regaining height quickly if no other birds followed. Eventually the whole flock would fly lower, finally skimming several meters over the grass and dropping into the field over a long swath of ground 15 m or more in length. When large flocks split into smaller groups during flight, the latter might end up in similar or quite different landing places. However, all birds in the main study area remained within it, and during our stay we saw no evidence of interchange between flocks occupying different areas around Sooner Lake.

The birds' flushing behavior changed markedly as sunset approached. As dusk fell, disturbed birds rose barely above the grass and moved only 5–10 m before dropping back to the ground. After dark, we were rarely able to make any birds flush.

Roost sites were marked by conspicuous piles of droppings, which often lay directly on the soil surface in a 5–10 cm opening in the grass. Piles of droppings could be found within a meter or two of each other, indicating that small groups of birds roosted together. Our observations indicated that longspur flocks roosted in the same areas where they spent the day, but because we disturbed birds at dusk we were unable to determine whether the roost sites were normally reused from night to night.

Alarmed birds gave a "rattle" call (Jehl 1968) when they flushed, and this appeared to cause other birds to flush as well. The same call was continued in the air. Single birds gave a noticeably longer and louder

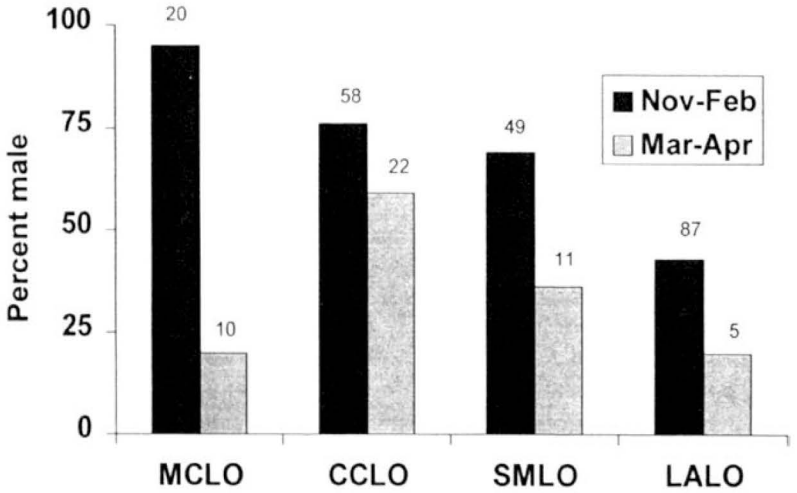

Fig. 2. Percent of longspurs collected in Oklahoma that were male (specimens at Oklahoma Museum of Natural History). Darker bar indicates birds collected in November through February, lighter bar is for birds collected in March and April. Sample size (number of specimens) is shown above bars. MCLO=McCown's Longspur, CCLO=Chestnut-collared Longspur, SMLO=Smith's Longspur, LALO=Lapland Longspur.

rattle call, whereas calls within groups become shorter and somewhat more twittery (less harsh sounding) as a flock continued to fly. Broadcast of taped longspur rattle calls quickly drew flying birds to circle high over the source of the sound, but the birds would not land. At dusk there was much less tendency for longpurs to make the rattle call and a greater chance of low-volume twitters or no calling at all. After dark any birds that flushed were silent.

A softer, more musical *syu* was occasionally given by birds during flight. Once we heard it from birds perched on a wire when a few others took off, and the latter soon settled back to the wires. We did not hear it from birds on the ground, where the longspurs usually were quiet. However, J. Grzybowski (pers. comm.) has heard Smith's Longspurs calling softly soon after landing.

Longspurs were not attracted to baited traps. They easily avoided mist nets in daylight, but could be herded towards nets at dusk when they did not flush far and nets were less visible. However, in four evenings of netting only one bird was captured this way. When we carried nets horizontally, about a meter above the grass, birds flushed ahead of it as long as it was daylight. We tried this one evening at dusk and captured two birds by quickly dropping the net when they flushed underneath it.

The sex ratio of Smith's Longpur specimens collected in Oklahoma was biased towards males early in the winter (Fig. 2). This was reversed in spring (March and April), when less than 50% of specimens were male.

DISCUSSION

Flight behavior of Smith's Longspurs at Sooner Lake was similar to that described by others (Kemsies 1968), as was the tendency for longspurs on the ground to be closely approachable but difficult to see. Landolt (1970) noted that Smith's Longspurs do not mix with other species.

Flock sizes in our study (10–30 birds flushing together) were somewhat larger than the average of 11–13 noted by Grzybowski (1983a), but smaller than the average group size of 50 cited by Briskie (1993). Grzybowski (1983a) found 1–2% of Smith's Longspurs as solitary birds (out of 178 groups), and we also found a few alone, but it is not known whether such birds are permanent loners or are only temporarily separated from flocks.

Density of longspurs on our main study site (250 birds/100 ha) was similar to the 140 and 298/100 ha cited by Grzybowski (1983a) for sites with medium and heavy grazing, respectively. Flocks may not use all of the area in the fields where they occur, however, so such density figures are rather arbitrary, depending on the size of area chosen for calculation. Density across the wider landscape is of course much lower, because longspurs are patchy in distribution.

Three-awn grass (*Aristida* spp.) has been mentioned in the literature as a food source (Kemsies 1968, Briskie 1993) and as an indicator of Smith's Longspur habitat (Landolt 1970, Grzybowski 1982, 1983b), an affinity

also well known to knowledgable birders (J. Hoffman, pers. comm.). *Aristida* seed is often, but not always, predominant in stomachs of birds collected from such fields (Kemsies 1968, Landolt 1970, J. Grzybowski, pers. comm.).

The association we noted between longspurs and wet places has been reported by others (Sheppard 1959, Kemsies 1968), and Smith's and other longspur species have also been reported flocking around water sources on migration (Kemsies 1968, With 1994, Hill and Gould 1997). However, other experienced observers have not noticed a regular association (J. Grzybowski, pers. comm.), and any connection beyond longspur use of water for drinking remains to be tested.

Our observations of calling behavior support Jehl's (1968) suggestion that the rattle call may function both as an alarm and as a means of gathering stray birds into a single flock. Landolt (1970) noted that Smith's Longspurs frequently gave a soft "clear whistle" that appeared to maintain spacing among birds on the ground, and this may have been the same as the *syu* call that we heard occasionally in flight. Jehl (1968) mentions a similar call in the breeding season, sometimes given in flight and also by females leaving the nest. Possibly it signals satisfaction with the safety of the bird's present location. Kemsies (1968) mentioned flushed longspurs landing again in response to calls from birds remaining on the ground, and we noted birds returning quickly to perch on a wire where undisturbed longspurs were giving *syu* calls.

The number of birds using the main study site was stable over the course of the week. Birds were never seen to leave the site, and several different flocks used well-separated locations, suggesting existence of stable winter flocks. Moreover, longspurs were present in the same fields at Sooner Lake throughout the 1997–98 winter and the one following (J. Hoffman, pers. comm.), indicating that flocks might remain faithful to a site throughout the season and perhaps between years. While longspurs have been seen to immigrate or emigrate in large numbers when weather conditions become severe (J. Grzybowski, pers. comm.), Landolt (1970) found that wintering flocks of longspurs (including Smith's) did not leave her study area during a December snowstorm that was heavy enough to markedly alter flocking behavior for several days, and flocks regrouped once the snow melted. These observations are anecdotal, however, and study of marked birds is needed to confirm stability of flocks and fidelity to wintering areas.

There is some evidence of differential timing of migration by sex in Smith's Longspurs. While casual observations of flocks suggested a mix of adult male and female/immature birds (the former distinguished by white shoulder patches), we did not obtain reliable information on sex ratio. However, museum specimens showed a bias towards males in early winter and toward females later on (Fig. 2). An Alberta observer noted a sex ratio of 3:1 adult males to females during migration (Kemsies 1968), and males may arrive earlier on the breeding grounds (Jehl 1968). Differ-

ential migration is known also for Chestnut-collared Longspurs (*C. ornatus*), in which males both leave the wintering grounds and arrive on breeding grounds earlier than females (Hill and Gould 1997).

Museum specimens further hint at a differential migratory distance for males and females. Oklahoma is at the northern end of the wintering range for two longspur species (Chestnut-collared and McCown's, *C. mccownii*), for which sex ratio of museum specimens collected in November–February was significantly biased towards males (Fig. 2, χ^2 test, $P < 0.001$). By contrast, the November–February sex ratio was not significantly different from 1:1 for Lapland Longspurs (*C. lapponicus*), for which Oklahoma is at the southern end of the wintering range, or for Smith's Longspurs, for which Oklahoma appears to be in the middle of the wintering range. To the extent that the museum collection is itself unbiased, these data suggest that male longspurs may winter farther south than females, although with a broad degree of overlap. This hypothesis needs confirmation with additional data, however.

While questions about site fidelity within and between years could be answered through observation of individually marked birds, the prospects for marking (and subsequent resighting) are poor. There is a brief period at dusk when the birds still flush readily but do not move far, and can be driven towards nets. Regular effort over a week or two may occasionally lead to success. Our method of capturing birds by carrying nets horizontally over flocks was not ideal, as after dark neither obstacles nor flushed birds could be seen, and nets were easily snagged on vegetation. However, enough birds could be caught to allow a short-term study of local movements using radio transmitters. Recordings of the *syu* call should be tested as a means of causing Smith's Longspurs to land near the source of sound and thus potentially near nets.

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